UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,590	01/26/2005	Volker Lohweg	W1.1913 PCT-US	6207

7590 04/11/2008

Douglas R Hanscom
Jones Tullar & Cooper
P.O. Box 2266 Eads Station
Arlington, VA 22202

EXAMINER	
REDDING, THOMAS M	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
04/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/522,590	**Applicant(s)** LOHWEG, VOLKER	
	Examiner THOMAS M. REDDING	**Art Unit** 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _24-41_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _24-41_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _26 January 2005_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _1/26/2005_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

In response to applicant's preliminary amendment, claims 24-41 are pending, claims 1-23 have been cancelled.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 24 - 29, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson et al. (US 7,050,629) in combination with Gath et al. (IEEE July 1989) and further in combination with Rimey (IEEE June 1988).

Regarding claim 24, Jackson discloses [a] method for evaluation of a multiple pixel output signal of an electronic image sensor in the course of pattern recognition of the image content of an image of a test body including;

generating a multiple pixel output signal;

analyzing the image content in said window by converting said output signal into at least one invariant characteristic value using at least one calculation specification in the form of a two-dimensional mathematical spectral transformation method selected from the group comprising a Fourier, Walsh, Hadamard or circular transformation ("Obtaining translational, rotational, and scaling invariant mathematical normalizations for a given translation, rotation, or scaling factor, is readily recognized by, and available to, one of ordinary skill in the art, and a variety of existing statistical and mathematical techniques and algorithms exist to achieve such normalizations. All such techniques and algorithms are intended to fall within the embodiments of the present disclosure. For example, Fourier transforms techniques and log-polar mapping techniques can be used to produce translational, rotational, and scaling invariant features for each segment", Jackson, column 4, line 10);

Jackson does not teach weighting said characteristic value with at least one indistinct affiliation function, said affiliation function defining a relationship between a value range of said characteristic value and a characteristic;

generating a higher order indistinct affiliation function by conjunctive linking of all of said affiliation functions of said characteristic;

determining a sympathetic value from said higher order affiliation function, said sympathetic value defining a degree to which a characteristic in said image is similar to a reference characteristic;

comparing said sympathetic value with a threshold value; and deciding a class affiliation for said signal from said comparison of said sympathetic value and said threshold value.

Gath, working in the same field of endeavor of cluster analysis, does teach weighting said characteristic value with at least one indistinct affiliation function, said affiliation function defining a relationship between a value range of said characteristic value and a characteristic ("μ_{ij} is the degree of membership of X_j in the j^{th} cluster", Gath, page 774, column 1, paragraph 4, applicant's "indistinct affiliation function" corresponds to Gath's fuzzy membership function μ_{ij}) ;

generating a higher order indistinct affiliation function by conjunctive linking of all of said affiliation functions of said characteristic ("The parameter q is the weighting exponent for μ_{ij} and controls the "fuzziness" of the resulting clusters [11]", Gath, page 774, column 1, paragraph 5, where q and μ_{ij} are parameters in $J_q(U,V)$) (eq. 1) which is a fuzzy objective function that is formed from conjunctive linking of all of said affiliation functions of said characteristic);

determining a sympathetic value from said higher order affiliation function, said sympathetic value defining a degree to which a characteristic in said image is similar to a reference characteristic (“Compute the degree of membership of all feature vectors in all the clusters:”, Gath, page 774, column 2, step 2 of the algorithm, where equation 2 is found from the higher order affiliation function, $J_q(U,V)$, by minimizing it with respect to U, "The fuzzy K-means algorithm [5] is based on minimization of
the following objective function, with respect to U, a fuzzy K-partition
of the data set, and to V, a set of K prototypes”, Gath page 774, column 1, paragraph 5);

comparing said sympathetic value with a threshold value; and deciding a class affiliation for said signal from said comparison of said sympathetic value and said threshold value (“if $\max_{ij}\left[\mu_{ij} - \hat{\mu}_{ij}\right] < \varepsilon$ stop, otherwise goto step 3:”, Gath page 774, column 2, when the class memberships fall within the threshold, the algorithm stops).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to combine the fuzzy classification method of Gath with the invariant feature based classification system of Jackson to accommodate "where boundaries between subgroups might be fuzzy, and where a more nuanced description of the object’s affinity to the specific cluster is required” (Gath, page 273, column 2, Introduction).

The combination of Jackson and Gath does not teach said signal comprising a window within said image of said test body having a size of n x n pixels.

Rimey, working in the same problem solving area of pattern classification does teach said signal comprising a window within said image of said test body having a size of n x n pixels ("2) Group coordinates into small local groups and estimate
the tangent plane of the surface under each group. We chose to group points by dividing the range image into square X-Y windows. A planar surface is then fitted to the coordinates in each window.
3) Use some method of assigning a surface classification to the area underlying the local area of each window", Rimey, page 277, column 2, steps 2 and 3 of the algorithm).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to combine the windowing method of Rimey with the fuzzy classification system of the combination of Jackson and Gath in order to break a segmentation task into smaller, easier tasks ("ML segmentation is decomposed into a series of smaller approximate ML tasks. This reduces the burden of computation while retaining close to optimal accuracy", Rimey, page 278, column 2, paragraph 3).

Regarding claim 25, the combination of Jackson, Gath and Rimey teaches further including dividing the image of said test body into a group of N x N grid-like windows each of said size of n x n pixels ("We chose to group points by dividing the

range image into square X-Y windows", Rimey, page 277, column 2, paragraph 2, step 2); analyzing image content of one of said n x n pixel windows ("Use some method of assigning a surface classification to the area underlying the local area of each window", Rimey, page 277, column 2, paragraph 2, step 3); defining two dimensional spectra from said image content; calculating spectral amplitude values from these two-dimensional spectra ("Fourier transforms techniques and log-polar mapping techniques can be used to produce translational, rotational, and scaling invariant features for each segment", Jackson, column 4, line 10)"; linking together said spectral amplitude values; and forming one said sympathetic value for each said window ("assigning a surface classification to the area underlying the local area of each window", Rimey, page 277, column 2, paragraph 2, step 3, where the surface classification is calculated via the fuzzy clustering method of Gath).

Regarding claim 26, the combination of Jackson, Gath and Rimey teaches further including forming only one said sympathetic value for each said window of said size of n x n pixels ("assigning a surface classification to the area underlying the local area of each window", Rimey, page 277, column 2, paragraph 2, step 3, where the surface classification is calculated via the fuzzy clustering method of Gath).

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Jackson, Gath and Rimey.

The combination of Jackson, Gath and Rimey discloses substantially the claimed invention as set forth in the discussion above for claim 26.

Although the combination of Jackson, Gath and Rimey does teach using square windows ("We chose to group points by dividing the range image into square X-Y windows", Rimey, page 277, column 2, paragraph 2, step 2), the combination doe not disclose expressly dividing the test body into a group of N x N grid-like windows.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to divide the test body into a group of N x N grid-like windows. Applicant has not disclosed that dividing the test body into a group of N x N grid-like windows provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the more general grid arrangement taught by the combination of Jackson, Gath and Rimey or the claimed group of N x N grid-like windows because both gridding approaches achieve the same goal of breaking a large task into a smaller one.

Therefore, it would have been obvious to one of ordinary skill in this art to modify the combination of Jackson, Gath and Rimey to obtain the invention as specified in claim 27.

Regarding claims 28 and 29, the combination of Jackson, Gath and Rimey teaches all the elements common to claims 24 and 25.

The combination of Jackson, Gath and Rimey as given above does not teach determining said sympathetic value using one of a main emphasis and a maximum method.

Gath does teach determining said sympathetic value using one of a main emphasis and a maximum method ("Thus, substituting (6) instead of (2) in step 2 of the fuzzy K-means algorithm results in the fuzzy modification of the maximum likelihood estimation (FMLE)", Gath, page 774, column 2, paragraph 3).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to further include the maximum likelihood estimation method of Gath with the fuzzy classification system of the combination of Jackson, Gath and Rimey to accommodate non-spherical clusters ("For hyperellipsoidal clusters, as well as in the presence of variable cluster densities and unequal numbers of data points in each cluster, an "exponential" distance measure, $d_e^2(X_j, V_i)$, based on maximum likelihood estimation [7], [11] , [15] is defined", Gath, page 774, column 2, paragraph 2).

Regarding claim 33, the combination of Jackson, Gath and Rimey as given above does not teaches wherein each said affiliation function is a unimodal function.

However, Gath further teaches wherein each said affiliation function is a unimodal function ("Therefore, the criteria for the definition of "optimal partition" of the data into subgroups were based on three requirements:

1) Clear separation between the resulting clusters.

2) Minimal volume of the clusters.

3) Maximal number of data points concentrated in the vicinity
of the cluster centroid. Thus, although the environment is fuzzy, the aim of the classification is generation of well-defined subgroups, and hence these requirements lead to a "harder" partitioning of the data set", Gath, page 775, column 1, paragraph 5).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to use the unimodal criteria of Gath, with the fuzzy clustering system of the combination of Jackson, Gath and Rimey since "A goal-directed approach [I61 to the cluster validity problem can be chosen, where the goal is classification, in the sense of minimization of the classification error rate. Hence, one may accept the basic heuristic that "good" clusters are actually not very fuzzy [11] (Gath, page 775, column 1, paragraph 5, Gath teaches that the clusters should resemble hard clusters which would lead to membership functions looking similar to hard membership functions).

Regarding claim 34 the combination of Jackson, Gath and Rimey teaches wherein each said higher order affiliation function is a multimodal function ("Hence, one may accept the basic heuristic that "good" clusters are actually not very fuzzy [11] (Gath, page 775, column 1, paragraph 5, and "Compute the degree of membership of all feature vectors in all the clusters:", Gath, page 774, column 2, step 2 of the algorithm, where equation 2 is found from the higher order affiliation function, $J_q(U,V)$, by minimizing it with respect to U. $J_q(U,V)$ is a summation of non-overlapping unimodal functions, and will itself tend to multimodal, having peaks corresponding to each of the component membership functions.)

Regarding claim 35, the combination of Jackson, Gath and Rimey teaches wherein at least one said affiliation function and said higher order affiliation function is a potential function ("$J_q(U,V) = \sum_{j=1}^{N} \sum_{i=1}^{K} (\mu_{i,j})^q d^2(X_j, V_i)$; $K \leq N$ (1)", Gath , page 774, column 1, equation 1, The objective function of Gath is a potential function in that it provides an description of the energy of a clustering solution and is minimized via it's gradients to find an optimal solution).

3. Claims 30-32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson et al. (US 7,050,629), Gath et al. (IEEE July 1989) and Rimey (IEEE June 1988) in combination with Wong et al. (IEEE 2000).

Regarding claims 30 and 31, the combination of Jackson, Gath, and Rimey teaches the method of claim 24 as described above.

The combination of Jackson, Gath and Rimey does not teach further including dividing said method into a learning phase and a work phase, using said learning phase for defining and matching at least one of a parameter and a threshold value, and, in said work phase, evaluating said image content of the image of the test body and evaluating said image using results from said learning phase.

Wong, working in the same problem solving area of fuzzy clustering, does teach further including dividing said method into a learning phase and a work phase ("The simulation result is listed in Table I. It illustrates that the training data can be guaranteed 100% classified by the design fuzzy classifier. In addition, the test data can achieve 96% classified rate by the generated fuzzy classifier with eight fuzzy rules so that the proposed design method has good generalization ability in the classification problem of iris data.", Wong, page 51, column 1, paragraph 3), using said learning phase for defining and matching at least one of a parameter and a threshold value ("After the cluster algorithm, the cluster centers and radius of the clusters $Record_{ik}$, are recorded as $Record\text{-}Center_{ik}$, and $Record\text{-}Radius_{ik}$. For each cluster, a fuzzy IF-THEN rule is used to represent it and is described by

R_{ik} : IF x is A_{ik} THEN x belongs to class l (7)

where A_{ik}, is a fuzzy set described by the following membership function:

$$A_{ik}(x) = \exp\left(\frac{-\left\| x - \mathrm{Re}cord\_Center_{ik} \right\|^2}{2\mathrm{Re}cord\_Radius_{ik}^{\ 2}} \right)$$

", Wong, page 50, column 2, paragraph 2, Wong's rules are based on parameters generated in the training step), and, in said work phase, evaluating said image content of the image of the test body and evaluating said image using results from said learning phase ("the test data can achieve 96% classified rate by the generated fuzzy classifier with eight fuzzy rules so that the proposed design method has good generalization ability in the classification problem of iris data.", Wong, page 51, column 1, paragraph 3).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to used the training method of Wong with the fuzzy classification system of the combination of Jackson, Gath and Rimey because Wong's method "has the following features: (a) it does not need prior parameter definition; (b) it only needs a short training time; and (c) it is simple", Wong, page 48, column 1, abstract).

Setnes working in the same field of endeavor of fuzzy clustering, does teach further including dividing said method into a learning phase and a work phase ("This paper is concerned with rule extraction from data by means of fuzzy clustering in the product space of inputs and outputs where each cluster corresponds to a fuzzy IF-THEN rule [10], [11]", Setnes, page 416, column 1, paragraph 3, a training step is used to define the parameters of the classifier, which is used to process the data), using said learning phase for defining and matching at least one of a parameter and a threshold value ("The TS model is identified in two steps. First, the fuzzy antecedents in the rules

are determined. The next section describes how this can be done using fuzzy clustering. In the second step, the rule antecedents are kept fixed, and least squares (LS) estimation from data is applied to determine the consequent parameters, a_i^T and b_i, of the rules", Setnes, page 417, column 1, paragraph 2), and, in said work phase, evaluating said image content of the image of the test body and evaluating said image using results from said learning phase ("This model is validated in a recursive simulation using the validation data shown in Fig. 7(b)", Setnes, page 423, column 1 and figure 7, Setnes using a fuzzy classifier to determine rules (training phase) and then tests the rule based classifier to validate his rule set (work phase).

Regarding claim 32, the combination of Jackson, Gath, Rimes and Setnes teaches further including providing a learning phase and using said learning phase for teaching said affiliation function ("In the case of univariate membership functions $\mu_{ij}(x_j)$ the fuzzy antecedent in the TS model is typically defined as an and-conjunction by means of the product operator

$$A_i(x) = \prod_{j=1}^{n} \mu_{ij}(x_j)$$

", Setnes, page 416, column 2, paragraph 2).

Regarding claim 36, the combination of Jackson, Gath, Rimes and Setnes teaches further including generating said higher order affiliation function by processing

partial steps of premise evaluation, activation and aggregation, wherein, in said premise evaluation step, an affiliation value is determined for each IF portion of a calculation specification ("First, the fuzzy antecedents in the rules are determined", Setnes, page 417, column 1, paragraph 2), wherein, in said activation step, an affiliation function is fixed for each IF...THEN calculation specification ("In the second step, the rule antecedents are kept fixed, and least squares (LS) estimation from data is applied to determine the consequent parameters a_i^T and b_i, of the rules", Setnes, page 417, paragraph 2), and wherein, during said aggregation step, said higher order affiliation function is generated by superimposing all of said affiliation functions formed during said activation ("In the case of univariate membership functions $\mu_{ij}(x_j)$ the fuzzy antecedent in the TS model is typically defined as an and-conjunction by means of the product operator

$$A_i(x) = \prod_{j=1}^{n} \mu_{ij}(x_j)$$

", Setnes, page 416, column 2, paragraph 2).

4. Claims 37, 38, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rimey (IEEE June 1988) in combination with Patti et al. (US 2004/00022436).

5. Regarding claim 37, Rimey teaches [a] method for evaluation of a multiple pixel output signal of an electronic image sensor in the course of pattern recognition of the image content of an image of a test body including;

generating a multiple pixel image of said test body to be evaluated;

dividing said image to be evaluated into N x N grid-like windows each having a size of n x n pixels pixels (“2) Group coordinates into small local groups and estimate

the tangent plane of the surface under each group. We chose to group points by dividing the range image into square X-Y windows. A planar surface is then fitted to the coordinates in each window.

3) Use some method of assigning a surface classification to the area underlying the local area of each window”, Rimey, page 277, column 2, steps 2 and 3 of the algorithm);

analyzing said image context of one of said windows of said size of n x n pixels (“Use some method of assigning a surface classification to the area underlying the local area of each window”, Rimey, page 277, column 2, paragraph 2, step 3).

Rimey does not teach defining two-dimensional spectra from said image contents; and forming a spectral transformation using a circular transformation.

Patti, working in the same problem solving are of pattern recognition, does teach defining two-dimensional spectra from said image contents; and forming a spectral

transformation using a circular transformation ("The invention provides a two dimensional smooth circular symmetric wavelet that is rotatable", Patti, paragraph 24)

It would have been obvious at the time the invention was made to use the circular wavelet based transformation of Patti with the segmentation system of Rimey as the properties of Patti's transform "make the matching method more useful and efficient in the optimal detection of a signal when in the presence of signal dilations and noise" (Patti, paragraph 90).

Regarding claim 38, the combination of Rimey and Patti teaches generating an invariant spectrum ("To illustrate the orientation-invariance of circular wavelets, consider the image Barbara in FIG. 2", Patti, paragraph 55).

Regarding claim 40, the combination of Rimey and Patti teaches further including performing said circular transformation using real coefficients ("This 2-D circular symmetric wavelet function is defined as:

$$h_a(x,y) = \frac{1-\left(x^2+y^2\right)/100a^2}{5\sqrt{\pi}\cdot a} e^{-(x^2+y^2)/100a^2}$$

which is generated by rotating a 1-D function, modified from the double derivative of the famous Gaussian probability density function (a is the scale factor)", Patti, paragraph 53, the coefficient "a" of this transform is a real number).

Regarding claim 41, the combination of Rimey and Patti teaches further including forming associated work coefficients by combining spectral coefficients in groups ("This

process continues until one of two conditions is met: the maximum number of coefficients is reached or the correlation between the original image and the matched wavelet is above a desired level", Patti, paragraph 127, Patti associates a group of wavelet coefficients with an image in his matching procedure).

Allowable Subject Matter

6. Claim 39 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach adjusting the invariance property of a transform by using the transform coefficients.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wong (IEEE 2000) teaches using a fuzzy classifier to determine rules for a classifier system. A formal translation of the publication "Volker Lohweg and Dietmar Müller: Ein generalisiertes Verfahren zur Berechnung von translationsinvarianten Zirkulartransfomationen für die Anwendung in der Signal- und Bildverarbeitung" has been ordered and the relevancy of this reference will be considered in the next action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS M. REDDING whose telephone number is (571)270-1579. The examiner can normally be reached on Mon - Fri 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. M. R./
Examiner, Art Unit 2624

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624